

II. REMARKS

Claims 9, 11 and 17 have been cancelled without prejudice. Claim 7 has been amended to recite “a cut that extends from the through hole and has a width smaller than a diameter of the through hole” as supported on page 13, lines 1-5, and by Figure 9, of Applicants’ disclosure as originally filed. Claim 7 has also been amended to incorporate subject matter from previous claims 9, 11 and 17.

Independent claims 7 and 21 have been amended to recite “a heater pressing plate, having an outside, disposed to press on the outside of the heater” as supported on page 7, lines 24-26, and on page 13, line 30, to page 14, line 3, and by Figure 8, of Applicants’ disclosure as originally filed. Claims 13 and 15 have been amended to depend upon claim 7. The present amendment has no further limiting effect on the scope of claims 13 and 15.

The present amendment adds no new matter to the application.

A. The Invention

The present invention pertains broadly to a reactor for generating moisture, having an inlet side and an outlet side, such as may be used to generate and feed moisture into, for example, a semiconductor manufacturing apparatus. In accordance with an embodiment of the present invention, a reactor for generating moisture is provided that includes the features recited by independent claim 7. In accordance with another embodiment of the present invention, a reactor for generating moisture is provided that includes the features recited by independent claim 21. Various other embodiments, in accordance with the present invention, are provided by the dependent claims.

An advantage provided by a reactor for generating moisture of the present invention is that it generates larger quantities of moisture with a greater margin of safety due to a plurality of fins that serve to dissipate heat generated by the reaction generating moisture.

B. The Rejections

Claims 7, 9, 11, 13, 15, 17, and 19 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 7 and 21 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Ohmi et al. (EP 0 922 667, hereafter the “Ohmi’667 Document”) in view of Hishikari et al. (JP 63-138220, hereafter the “Hishikari Document”) and Matsunaga et al. (U.S. Patent 5,375,652, hereafter the “Matsunaga Patent”). Claims 9, 11, 13, 15, 17, 22, 23 and 25-27 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the Ohmi’667 Document in view of the Hishikari Document and the Matsunaga Patent, and further in view of Nelson (U.S. Patent 3,180,404, hereafter the “Nelson Patent”). Claims 19 and 24 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the Ohmi’667 Document in view of the Hishikari Document and the Matsunaga Patent, and further in view of Asanuma et al. (U.S. Patent 4,369,838, hereafter the “Asanuma Patent”).

Applicants respectfully traverse the rejections and request reconsideration of the above-captioned application for the following reasons.

C. Applicants’ Arguments

In view of the present amendment, claims 7, 9, 11, 13, 15, 17, 19 and 21-27 are now in compliance with 35 U.S.C. § 112. Specifically, claim 7 now recites “a cut that extends from the through hole and has a width smaller than a diameter of the through hole” as supported on page 13, lines 1-5, and by Figure 9, of Applicants’ disclosure as originally filed.

i. The Section 103 Rejections

A prima facie case of obviousness requires a showing that the scope and content of the prior art teaches each and every element of the claimed invention, and that the prior art provides some teaching, suggestion or motivation to combine the references to produce the claimed invention. In re Oetiker, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992); In re Vaeck, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). In this case, the Examiner has failed to establish a prima facie case of obviousness against Applicants' claimed invention because neither the Ohmi'667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, nor the Asanuma Patent, either alone or in combination, teaches or suggests each and every claimed limitation, arranged as in the claims.

ii. The Ohmi'667 Document

The Ohmi'667 Document discloses a "method for generating water for semiconductor production" that involves feeding hydrogen and oxygen into a reactor provided with a platinum-coated catalyst layer on an interior wall in order to enhance the reactivity between hydrogen and oxygen (See Abstract of the Ohmi'677 Document). The Ohmi'667 Document discloses in Figures 8, 9 and 10, three embodiments of a reactor (page 5, lines 53-58). As conceded by the Examiner (Office Action, dated May 10, 2007, at 4, lines 10-14), the Ohmi'667 Document does not teach, or suggest, (i) "fin base plates attached to the outside walls of the first and second components;" (ii) "a plurality of fins disposed on the fin base plates...;" (iii) "a heater, having an outside, disposed on the outside wall of the second component;" (iv) "a heater pressing plate, having an outside, disposed ...on the outside of the heater, wherein the fin base plate is attached to the outside of the heater pressing plate" as recited by independent claims 7 and 21.

The Examiner further admits that the Ohmi'677 Document does not teach, or suggest, (v) "at least one of the fin base plates comprises a through hole for the corresponding joint, and a notch connected with the through hole and having a width that is smaller than the diameter of the through hole" as recited by independent claim 21 (Office Action, dated May 10, 2007, at 5, lines 11-14). For the same reason, the Ohmi'667 Document does not teach, or suggest, (vi) "at least one of the fin base plates comprises a through hole for the corresponding joint, and a cut that extends from the through hole and has a width smaller than a diameter of the through hole" as recited by independent claim 7.

The Examiner also admits that the Ohmi'667 Document does not teach, or suggest, (vii) "the fins are disposed centrally symmetrical about the material gas supply joint and the moisture gas take-out joint" as recited by independent claim 7 (Office Action, dated May 10, 2007, at 7, lines 16-18).

iii. The Hishikari Document

The Hishikari Document discloses a "blackbody furnace" as shown in Figure 1, wherein the "furnace" is provided with a cavity (1), a soaking plate (2), an "electronic cooling element" (5) provided to cool the soaking plate (2), a heater (4) in contact with the soaking plate (2), a holding member (6) and a radiation fin (7), (See Delphion English Abstract for JP 63-138220, of record). The Hishikari Document discloses that the radiation fin (7) is provided on only one side of the cavity (1) as shown by Figure 1.

The Examiner erroneously contends that the “electronic cooling element” (5) disclosed by the Hishikari Document is, or functions as, a “heater pressing plate” in accordance with Applicants’ claimed invention (Office Action, dated May 10, 2007, at 4, lines 18-20). However, the Examiner is required to give a fair reading of a reference for what it teaches as a whole, In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984), which the Examiner has not done.

A person of ordinary skill in the art would instantly appreciate from Figure 1 of the Hishikari Document, and from the Delphion English Abstract for the Hishikari Document, that the radiation fin (7) has a plate portion (unlabeled) into which the bolts (60) delve such that the plate portion of the fin (7) is attached to the holding member (6) via bolts (60). Nothing in the disclosure of the Hishikari Document would lead a person of ordinary skill in the art to conclude that the plate portion of fin (7) strongly presses against the electronic cooling element (5). Consequently, there is nothing in the disclosure of the Hishikari Document that would lead a person of ordinary skill in the art to conclude that the “electronic cooling element” (5) is a plate that presses the heater (4). On the contrary, a person of ordinary skill in the art would appreciate that the plate portion of the fin (7) is secured to the holding member (6), and that the plate portion merely seals the electronic cooling element (5) into a space shown formed in the holding member (6). In fact, it is the holding member (6) that holds the electronic cooling element (6) and not the fin (7).

As stated by the Delphion English Abstract for the Hishikari Document

“...a heater 4 is provided so as to come into contact with the soaking plate 2, and also, an electronic cooling element is provided so as to cool the soaking plate 2 through the heater 4. They are held by a holding member 6, and a radiation fin 7 is provided on the back part of the member 6” (emphasis added).

A person of ordinary skill in the art would also know that an electronic cooling element is fragile and would not withstand pressing by the plate portion of the fin (7). Furthermore, a person of ordinary skill in the art would appreciate, as shown in Figure 1 of the Hishikari Document, a small space separating the heater (4) from the electronic cooling element (5) so that while the heater (4) and cooling element (5) may be in thermal contact with one another, the drawing shows that these two components are not in physical contact with one another. Thus, a person of ordinary skill in the art should conclude, based on the structure shown in Figure 1 of the Hishikari Document, that the heater (4) and the cooling (5) element are not in physical contact with one another so that the “electronic cooling element” (5) cannot press the heater (4).

A person of ordinary skill in the art would understand from Figure 8, and page 13, line 30, to page 14, line 3, of Applicants’ disclosure as originally filed that a “heater pressing plate” is an element that presses firmly against the “heater” when the “fin base plate is attached to the outside of the heater pressing plate.” For all of the above reasons, the “electronic cooling element” (5) disclosed by the Hishikari Document does not press firmly against the heater (4) so it cannot be reasonably construed to be a “heater pressing plate” in accordance with Applicants’ claimed invention.

In view of the above facts, it is not a fair reading of the Hishikari Document to construe the “electronic cooling element” (5) as a “heater pressing plate... disposed to press on the outside of the heater” as recited by Applicants’ claims 7 and 21.

iv. The Matsunaga Patent

The Matsunaga Patent discloses, as shown in Figures 1(A), 1(B) and 3(A), a “heat radiating apparatus for a semiconductor device,” wherein a fixing hardware spring (2) is provided with a notch (2h), (col. 3, lines 14-53). The Matsunaga Patent discloses other embodiments of the fixing hardware spring in Figures 6 and 8.

v. The Nelson Patent

The Nelson Patent discloses “cooling electronic heat unit producing elements and the like,” as shown in Figures 1-3, wherein fins (22) for dispersing conducted heat may be arranged around an opening (24) through which a stud-nut combination (26) and (27) passes (col. 2, lines 1-23). The Nelson Patent does not teach, or suggest, “wherein the fins are disposed centrally symmetrical about the material gas supply joint and the moisture gas take-out joint” as recited by independent claim 7.

vi. The Asanuma Patent

The Asanuma Patent discloses a “device for releasing heat,” as shown in Figure 1, which includes a multiplicity of tongue-like raised fins (3) that may be treated with alumite (col. 5, lines 5-8).

vii. Summary of Deficiencies of the Five Disclosures

The Ohmi'667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, and the Asanuma Patent, either alone or in combination, still fails to teach or suggest (i) "a heater pressing plate, having an outside, disposed to press on the outside of the heater" as recited by independent claims 7 and 21; (ii) "fin base plates attached to the outside walls of the first and second components" and "a plurality of fins disposed on the fin base plates" as recited by independent claims 7 and 21;" (iii) "the fins are disposed centrally symmetrical about the material gas supply joint and the moisture gas take-out joint" as recited by claim 7; (iv) "said fins are axially symmetrical about said material gas supply joint" as recited by claims 13 and 25; and (v) "said fins are axially symmetrical about said moisture take-out joint" as recited by claims 15 and 26.

In particular, the Examiner's reliance on the Hishikari Document to teach a "heater press plate" is flawed because the Hishikari Document discloses an electronic cooling element located near a heater, but it does not teach, or suggest, a "heater press plate...disposed to press on...the heater" as recited by independent claims 7 and 21.

Unilateral vs. Bilateral Distribution of Fins

As conceded by the Examiner (Office Action, dated May 10, 2007, at 5, lines 4-9, neither the Ohmi'667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, nor the Asanuma Patent teach, or suggest, "fin base plates attached to the outside walls of the first and second components" and "a plurality of fins disposed on the fin base plates" as recited by independent claims 7 and 21. In fact, the Hishikari Document plainly teaches an asymmetrical distribution of fins (7), as shown in Figure 1, on only one side of the cavity (1). The fins (7) of the Hishikari Document are employed to improve the function of

the cooling element (5). The radiator (1), shown in Figure 1(B) of the Matsunaga Patent, is deployed on circuit board (4) in a plainly asymmetrical, unilateral fashion to maintain the function of a semiconductor device (3), (Matsunaga Patent, col. 1, lines 7-11). Likewise, the fins (22) shown in Figure 3 of the Nelson Patent are disposed on only one end of the casing (25) and the fins (3) shown in Figure 1 of the Asanuma Patent are disposed on only one side of horizontal portion (5b). Both the Nelson Patent and the Asanuma Patent employ asymmetric, unilateral distribution of fins to cool down electronic components and/or semiconductors (See Nelson Patent, col. 1, lines 10-14; and Asanuma Patent, col. 1, lines 5-7).

In sum, the Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent, each plainly disclose the asymmetric, unilateral distribution of fins on a device. None of the disclosures relied upon by the Examiner teaches, or even suggests, disposing fins on the outer surfaces of both sides (i.e., the inlet side and the outlet side) of a reactor. An advantage of the presently claimed invention is that equalization of temperature of the interior space (6) of a reactor is achieved by disposing fins on both sides of the reactor, such as is shown by the non-limiting example of Figure 8 of the above-captioned application. Consequently, a reactor, in accordance with the present invention, benefits from a moisture generation reaction inside the reactor that is more equalized. On the other hand, the Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent each employ radiation fins for totally different reasons than that of the present invention; namely, these four documents employ radiation fins solely to radiate heat generated by a device whereas the present invention employs fins to equalize temperature inside a reactor so as to equalize a moisture generation reaction within the reactor.

As discussed above, the Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent disclose asymmetrical, unilateral distribution of fins on a device. While the Nelson Patent discloses deploying fins symmetrically about a stud-bolt combination, the Nelson Patent does not teach, or suggest, deploying fins symmetrically about an axis about joints (12) and (9) as shown in Figure 8 of the above-captioned application. When fins are disposed “axially symmetrical about said...joint,” as recited by claims 13, 15, 25 and 26, then temperature distribution of the reactor becomes “axially symmetrical” too, which prevents any local temperature increase. The result is that moisture generation inside the reactor becomes more stable.

In sum, none of the cited documents teach, or suggest, disposing fins on both sides of a reactor, and none of the cited documents teach, or suggest, disposing fins so as to be “axially symmetrical” with a “joint” so that the cooling process stabilizes a reaction by rendering the temperature distribution within the reactor also “axially symmetrical.”

For all of the above reasons, the Examiner has failed to establish a prima facie case of obviousness against Applicants’ claims 7, 9, 11, 13, 15, 17,19, and 21-27.

viii. Lack of Motivation and Improper Hindsight

As discussed above, the Examiner’s combination of the Ohmi’667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, and the Asanuma Patent is insufficient to teach each and every limitation of the claimed invention. However, this is not the only deficiency in the Examiner’s rejection. The application of five references plus caselaw makes it clear that the Examiner is impermissibly picking and choosing among isolated disclosures to deprecate the claimed invention. In re Fritch, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992). The Federal Circuit has ruled that individual references cannot be employed as a mosaic to recreate a facsimile of the claimed invention; rather, there must be

some teaching, suggestion, or incentive to make the combination made by the inventors.

Northern Telecom, Inc. v. Datapoint Corp., 15 U.S.P.Q.2d 1321, 1323 (Fed. Cir. 1990).

In this case, the Examiner contends that while five individual references are insufficient to establish a prima facie case of obviousness, the holes in the Section 103 rejection may be plugged up by case law (See Office Action, May 10, 2007, at 5, lines 4-10). Specifically, the Examiner concedes that the combination of the Ohmi'667 Document, the Hishikari Document and the Matsunaga Patent fail to teach, or suggest, providing

“the heater and cooling unit of Hishikari et al. on both the outside walls of the first and second component 2, 3 in the apparatus of Ohmi et al.” (Office Action, May 10, 2007, at 5, lines 5-7).

Instead, the Examiner employs St. Regis Paper Co. v. Bemis Co., Inc., 193 U.S.P.Q. 8, 11 (7th. Cir. 1977) and In re Harza, 124 U.S.P.Q. 378 (C.C.P.A. 1960), as if they were prior art to make up the deficiency. The Examiner's use of the case law is improper for the following reasons.

St. Regis Paper Co. v. Bemis Co., Inc.

The Examiner cites St. Regis Paper Co. v. Bemis Co., Inc., 193 U.S.P.Q. at 8, for the proposition that “duplication of parts for added effect was held to have been obvious” (Office Action, dated May 10, 2007, at 5, lines 8-10). However, in St. Regis Paper Co. v. Bemis co., Inc., 193 U.S.P.Q. at 11, the invention at issue was a multilayered bag and the court noted that it was well known in the art, by the patent owners own admission, to increase the strength of a bag by forming its walls from multiple layers. Based on these facts, the court held that it would have been obvious to improve the strength of a bag by adding more layers to its walls. Id.

In the present case, there is no admission of record by the Applicants that it is well known in the art to apply fins to both sides of a reactor, or even to duplicate the number of fins on one side. Furthermore, the Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent, each plainly disclose a one-sided asymmetric distribution of fins on a device. Based on the facts of this case, the Examiner has not shown that it would have been obvious to duplicate the fins so there is a two-sided distribution of fins. Even if, assuming *arguendo*, the holding of St. Regis Paper Co. v. Bemis co., Inc. could be applied to the present case (which is not a valid assumption), based on the disclosures of the Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent and the court's holding in St. Regis Paper Co. v. Bemis co., Inc., 193 U.S.P.Q. at 11, any "duplication" would occur on the same side of the device. In other words, based on the court's decision in St. Regis Paper Co. v. Bemis co., Inc., there would be twice as many fins all disposed on a single side of the device and not a bilateral distribution of radiation fins as the Examiner contends.

In re Harza

The Examiner cites In re Harza, 124 U.S.P.Q. at 378, for the proposition that "duplication of parts for added effect was held to have been obvious" (Office Action, dated May 10, 2007, at 5, lines 8-10). However, the Examiner has wholly misconstrued the ruling in the Harza case, which actually establishes, as a matter of law, that duplication of parts under the facts of the present case is nonobvious for the following reasons.

In In re Harza, 124 U.S.P.Q. at 379, the invention, according to independent claims 1 and 7, was a “water stop” consisting of an elongated web having a plurality of ribs on each side integral with the web, such as is used to fill the gap between concrete pours intended for retaining water. With respect to independent claim 1, the court noted that the Gardner Patent (U.S. Patent 2,228,052) taught all of the claimed subject matter except for a plurality of ribs on each side of the web because Gardner disclosed only one rib on each side. In re Harza, 124 U.S.P.Q. at 380. The court concluded that independent claim 1 was obvious over the teachings of Gardner because the duplication of parts, under these facts, would have been obvious. Id.

With respect to independent claim 7, the Harza court came to the opposite conclusion. The court considered the combination of the Gardner Patent in view of the Roberts Patent (U.S. Patent 2,139,851) and the Schurman Patent (U.S. Patent 2,282,829). In re Harza, 124 U.S.P.Q. at 381. The court concluded that it would not be obvious to duplicate the ribs because the prior art did not teach, or suggest, the claimed spatial relationship between the ribs on opposite sides of the web. Id. In other words, the Harza court drew a line with respect to duplication of parts and obviousness such that the mere duplication of parts disclosed by a single reference is obvious, but that the duplication and rearrangement of parts when constructing a device from a combination of references is nonobvious.

In this case, the Examiner has rejected Applicants’ independent claims 7 and 21 over the combination of the Ohmi’667 Document, the Hishikari Document, and the Matsunaga Patent. The Ohmi’667 Document is completely silent regarding radiation fins. The Hishikari Document, the Matsunaga Patent, the Nelson Patent and the Asanuma Patent each disclose unilateral fin distributions. In accordance the facts of this case and the patentability line drawn by the Harza court, while it may be obvious to increase the number of a radiation fins disclosed by a single reference, it is nonobvious as a matter of law to increase the number of

the radiation fins and then to rearrange the added fins bilaterally on a device constructed from a combination of the Ohmi'667 Document, the Hishikari Document, and the Matsunaga Patent in order to mimic what the inventors have done because the Hishikari Document and the Matsunaga Patent disclose only unilateral fin distributions.

For the above reasons, the Applicants have shown that the Examiner's combination of the Ohmi'667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, and the Asanuma Patent is based on improper hindsight so that the Examiner has, for additional reasons, failed to establish a prima facie case of obviousness against Applicants' claimed invention.

III. CONCLUSION

In view of the present amendment, claims 7, 13, 15, 19 and 21-27 are in compliance with 35 U.S.C. § 112. Furthermore, the Examiner's Section 103 rejections are untenable and must be withdrawn because the combination of the Ohmi'667 Document, the Hishikari Document, the Matsunaga Patent, the Nelson Patent, and the Asanuma Patent still fails to teach, or suggest, (i) "a heater pressing plate...disposed to press on the outside of the heater" and (ii) "fin base plates attached to the outside walls of the first and second components" and "a plurality of fins disposed on the fin base plates" as recited by independent claims 7 and 21. Furthermore, as a matter of law, the Examiner's Section 103 rejection is untenable and must be withdrawn in accordance with In re Harza, 124 U.S.P.Q. at 381, because the Examiner has employed improper hindsight and failed to establish a proper justification for duplicating and rearranging radiation fins to mimic what the present inventors have done.

For all of the above reasons, claims 7, 9, 11, 13, 15, 17, 19, and 21-27 are now in condition for allowance, and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below signed attorney for the Applicants.

Respectfully submitted,

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